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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Ichiro FUJIEDA et al.

Appln. No.: 08/932,238

Group Art Unit: 2878

Filed: September 17, 1997

Examiner: Q. Le

For: IMAGE SENSOR DEVICE USING THIN FILM LIGHT SOURCE

SUBMISSION OF APPELLANTS' BRIEF ON APPEAL

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Submitted herewith please find an original and two copies of Appellants' Brief on Appeal. A check for the statutory fee of $300.00 is attached. Authorization is also given to charge or credit any difference or overpayment to Deposit Account No. 19-4880. A duplicate copy of this paper is attached.

Respectfully submitted,

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Date: July 12, 2000

PATENT APPLICATION
ATTORNEY DOCKET NO. Q46789

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

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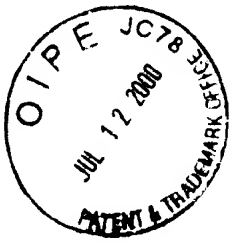

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APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

This is an Appeal from the Final Rejection of January 7, 2000 (Paper No. 15) of Claims 1-6 and 43-52.

Three copies of this Brief are enclosed.

I. STATUS OF CLAIMS

- The original application filed September 17, 1997 contained **claims 1-42**.
- On March 26, 1999, in response to Requirement to Elect Species (dated March 1, 1999), Appellants filed an Amendment and Response electing the Species illustrated in Figure 8B, and adding new independent **claim 43**. In the March 26, 1999 Amendment and Response, Appellants noted that:
    1. **claim 43** is generic to species illustrated in Figures 8B, 9B, 13, 16 and 17;

2. **claims 1-12** are directed to species illustrated in Figures 8B, 9B, 13, 16 and 17, and therefore, claims 1-12 would be subject to examination in this application upon the allowance of claim 43; and

3. **claims 1, 2 and 4**, readable on the species illustrated in Figure 8B, are subject to immediate examination as covering the elected species.

- On May 10, 1999, in the Office Action, Paper No. 9, the Examiner indicated that **claims 1-6 and 43** were subject to examination in this application.
- On August 6, 1999, Appellants filed an Amendment adding dependent **claims 44-51** and an independent **claim 52**.

Claims 1-6 and 43-52, all the claims under consideration in the application, stand finally rejected.

II. STATUS OF AMENDMENTS

Appellants' Amendment, filed March 8, 2000, in reply to the final Office Action (Paper No. 15) dated January 7, 2000 will be entered for the purpose of this appeal.

III. SUMMARY OF THE INVENTION

The present invention relates to image sensor devices which can be installed in an image input device such as a facsimile or a hand-held scanner.

A conventional image sensor device, as illustrated, for example in Appellants' Fig. 1, "consists of an optical fiber collection member 1202 composed of a plurality of bundled optical fibers 1202; an illumination unit 1204 utilizing electroluminescence (EL); photoelectric conversion element 1203 utilizing a thin film semiconductor such as amorphous silicon (a-Si); and a light blocking unit 1205. ...[T]he photoelectric conversion elements 1203 of such structure are sequentially arranged ... [and the] number of the photoelectric conversion elements ranges from several hundred to several thousand. ... Light emitted uniformly from the illumination unit 1204 travels through the optical fibers 1202 to reach a document 1290. The reflected light from the document 1290 partially travels through the inside of the document and a small gap between the document and the optical collection member 1201, and passes through the inside of the optical fiber 1202. This reflected light is detected by the photoelectric conversion element 1203. ... If the light from the illumination unit 1204 is incident on the photoelectric conversion [element] 1203, contrast of the image read out form the document is deteriorated. This is prevented by the light blocking unit 1205 which prevents light from being directly incident on the photoelectric conversion element 1203" (Appellants' specification, page 2, line 1 - page 3, line 8; see also Appellants' Figure 2 and Appellants' specification, page 3, lines 2-17).

In another example of a conventional image sensor (see Appellants' Figure 3), which does not use an optical fiber collection element, "a sensor section 1410 and an illumination section 1420 are formed in parallel on a glass substrate 1401 ... . The sensor section 1410 is constituted by arranging an a-Si layer 1403 between a bottom electrode 1402 and a transparent electrode 1404 and the illumination section 1420 is constituted by arranging an electrode 1405

and a transparent electrode 1407. ... Light emitted from the illumination section 1420 toward a document 1490 passes through a protection layer 1408 to irradiate the document 1490. The reflected light from the document 1490 is partially detected by the sensor section 1410, thereby obtaining brightness information of the document 1490" (Appellants' specification, page 5, lines 2 - 18; see also Appellants' Figure 4 and Appellants' specification, page 6, line 3 - page 7, line 3).

In all of the conventional image sensor devices, the light emission portions are not aligned with, and do not overlap, the light receiving elements (see, for example, Appellants' Figures 5, 6A and 6B illustrating the relative position of light emission layer 1623 and photoelectric conversion element 1612). Since (1) "the portion in the document facing the light emission section of the thin film light source is illuminated most strongly", (2) "the light reflected from the document is in general diffused", and (3) "the light reflected toward the photoelectric conversion element is alone detected", in conventional image sensor devices "the reflected light from the place [on the document] facing the illumination section [i.e., the light emission section] capable of performing illumination with most effectiveness can not be utilized [and] a large majority of emitted light is wasted" (see Appellants' specification, page 11, lines 1-14). Thus, conventional image sensor devices suffer the drawbacks of (1) requiring increased power for consumption by the light emission sections, and/or (2) requiring increased size for accommodating widened light emission sections (see Appellants' specification, page 11, lines 14-26).

Appellants' claimed invention overcomes the above-noted drawbacks of conventional image sensor devices by providing image sensor devices having "light emission portions emitting light to said document, ... at least one of said light emission portions being substantially aligned with a corresponding light receiving element" (Appellants' independent base claim 1; see also Appellants' independent base claim 43), and providing image sensor devices having "light emission portions [which] emit light to said document, ... at least one of said light emission portions and a light receiving element corresponding to said at least one of said light emission portions substantially overlap" (Appellants' independent claim 52).

An example of an image sensor device in accordance with Appellants' claimed invention is illustrated in Appellants' Figures 7, 8A and 8B which show different views of the same image sensor device (see Appellants' specification, page 18, lines 6-16). In particular, "[a]s shown in Fig. 8A, the thin film light source 120 and the image sensor 110 are stacked interposed by an adhesive layer 130 so as to dispose the light emission layer 123 at the center of the photoelectric conversion element 112. ... [A]s shown in Fig. 8B, in this embodiment, the light emission portion for the thin film light source 120 is limited to the place facing the center of the photoelectric conversion element 112. The light emitted from these light emission portions passes through the transparent substrate 121 to illuminate limitedly the portion of the document 190 closest to the corresponding photoelectric conversion element 112 corresponding to this light emission portion ... . [Therefore,] the portion of the document which is illuminated most strongly almost agrees with the portion of the document 190 facing the photoelectric conversion element 112. ... [Furthermore,] the portion of the document to be readout is limitedly illuminated, whereby the photoelectric conversion devise

disposed closest to that portion can detect the reflected light effectively. Therefore, ... it will be possible to read out the image with a high resolution. Moreover, since the probability of incidence of the reflected light onto the photoelectric conversion element is high, the quality of light emission of the light source can be reduced and the power consumption can be suppressed to be little." (See Appellants' specification, page 21, line 6 - page 23, line 15).

IV. ISSUES

1. Whether claims 1, 46 and 49 (and, thereby, their respective dependent claims 2-6, 44, 45, 47, 48, 50 and 51) are indefinite within the meaning of 35 U.S.C. §112, second paragraph.

2. Whether claims 1, 3, 43-46, 48-50 and 52 are anticipated by Appellants' admitted prior art within the meaning of 35 U.S.C. §102(e).

3. Whether claims 1, 3, 43-46, 48-50 and 52 are anticipated by Funada et al. within the meaning of 35 U.S.C. §102(e).

4. Whether claims 2, 4-6, 47 and 51 would have been obvious within the meaning of 35 U.S.C. §103(a) from Appellants' admitted prior art.

5. Whether claims 2, 4-6, 47 and 51 would have been obvious within the meaning of 35 U.S.C. §103(a) from Funada et al.

V. GROUPING OF CLAIMS

Independent claims 1, 43 and 52, stand or fall independently of each other. Dependent claims 2-6 and 44-47 stand or fall together with their base claim 1. Dependent claims 48-51 stand or fall together with their base claim 43.

VI. ARGUMENTS

1. Claims 1-6 and 43-52 are not indefinite within the meaning of 35 U.S.C. §112, second paragraph.

In view of the Examiner's comments (in the final Office Action. Paper No. 15, dated January 7, 2000), Appellants amended claims 1, 43, 46, 49 and 52 as set forth in the Amendment filed March 8, 2000 which has been entered for this appeal.

In particular, Appellants amended claims 1, 43 and 52 to delete the term "such" (which was deemed indefinite by the Examiner (see final Office Action (Paper No. 15)), and claims 46 and 49 more clearly to recite that "substantially all surface area of said at least one of said light emission portions is between said corresponding light receiving element and said document."

With regard to claims 46 and 49, the recitation of "said corresponding light receiving element" (rather than "elements", as suggested by the Examiner (see final Office Action (Paper No. 15)) has antecedent basis in the parent claim, and is proper because the dependent claims 46 and 49 define a relationship between the surface area of "**said at least one** of said light receiving

elements" and "said corresponding light receiving **element**" (Appellants' claims 46 and 49, emphasis added).

Accordingly, claims 1, 46 and 49 (and their respective dependent claims 2-6, 44, 45, 47, 48, 50 and 51) are not indefinite within the meaning of 35 U.S.C. §112, second paragraph.

2. Claims 1, 3, 43-46, 48-50 and 52 are not anticipated by Appellants' admitted prior art within the meaning of 35 U.S.C. §102(e).

The Examiner maintains that Appellants' admitted prior art as illustrated in Appellants' Figures 1-6B discloses every feature of Appellants' invention as recited in claims 1, 3, 43-46, 48-50 and 52.

One of the features of Appellants' claimed invention is "at least one of said light emission portions being substantially aligned with a corresponding light receiving element" (independent base claim 1; see also independent base claim 43). That is, at least one of the "light emission portions emitting light to said document" is substantially aligned with its corresponding light receiving element (see claims 1 and 43). On the other hand, Appellants' independent claim 52 requires that "at least one of said light emission portions and a light receiving element corresponding to said at least one of said light emission portions substantially overlap" (claim 52).

In contradistinction to Appellants' claimed invention, in the prior art devices illustrated in Appellants' Figures 1-6B, the light emission portions (e.g., "illumination unit 1310" in Figure 2, light emitting portions of "dispersion-type EL element 1504" in Figure 4, and "light emission layer 1623" in Figure 6A) which emit light to the document ("1390" in Fig. 2, "1590" in Figure 4, and "1690 in Figure 6A) are not substantially aligned with (in contradistinction to claims 1 and 43), and do not substantially overlap (in contradistinction to claim 52), their corresponding light receiving elements ("light receiving element array 1306" in Figure 2, "light receiving element array 1502" in Figures 4, and "photoelectric conversion elements 1612" in Figure 6A). In fact, because in the prior art devices (as described in Appellants' specification and illustrated in Appellants' Figures 1-6B) the light emission portions are not substantially aligned with, and/or do not substantially overlap their corresponding light receiving elements, these prior art devices suffer from the very drawbacks (increased power consumption and increased size, as described above) that Appellants' claimed invention is intended to overcome. Therefore, the prior art devices as described in Appellants' specification do not disclose or even suggest Appellants' claimed invention.

The Examiner alleges that "Figure 3 [sic, Figure. 2] shows that ... at least one end of the fibers 1301 is substantially aligned with the corresponding light receiving element 1306", and that "light emission window 1504 [sic, 1510], shown in Figure 4, is substantially aligned with the corresponding light receiving element 1502" (final Office Action (Paper No. 15) at page 5). However, fibers 1301 and windows 1510 are not light emission portions that emit light to the document, as defined in Appellants' claims 1, 43 and 52.

Appellants' specification describes that in prior art devices as illustrated in Appellants' Figure 2, "[t]he light reflected from the document passes through the optical fiber array 1301" (page 4, lines 14-17). Therefore, fibers 1301 do not emit light to the document, but simply pass the light reflected from the document to the light receiving element array 1306 (see Appellants' Figure 2).

Appellants' specification further describes that in prior art devices "[i]n the dispersion-type EL element 1504, a light transmission window 1510 is formed corresponding to the light receiving element array 1502", and that "[t]he reflected light from the document 1590 partially passes through the light transmission window 1510" (Appellants' specification, page 6, lines 12-15 and 24-26). The portion of the dispersion-type EL element 1504 that emits light to the document (i.e., the portion which includes light emission layer 1506) is not aligned with the light receiving element 1502 (see Appellants' Figure 4). On the other hand, window 1510 does not emit light to the document but simply passes the light reflected from the document to the light receiving element 1502.

Likewise, as shown in Appellants' Fig. 6A,

> Light emitted from the light emission layer 1623 passes through the transparent substrate 1621 to illuminate a document 1690. The reflected light from the document 1690 partially passes through the transparent substrate 1621 and the opening potion 1625 and is detected by the photoelectric conversion element 1612 ... (Appellants' specification, page 9, lines 11-17; see Appellants' Figure 6A).

Clearly, opening portion 1625 is not a "light emission portion" that emits light to the document, but is simply an "openings" for passing the light reflected form the document.

Therefore, contrary to the Examiner's analysis, fibers 1301, windows 1510, and opening portions 1625 are not "light emission portions emitting light to said document", as recited in Appellants' independent claims 1, 43 and 52.

Accordingly, independent base claims 1 and 43 (as well the dependent claims 3, 43-46 and 48-50 which more specifically define the features recited in their respective base claims) and independent claim 52 are not anticipated by (i.e., are not readable on) Appellants' admitted prior at least for the reasons noted above.

3. Claims 1, 3, 43-46, 48-50 and 52 are not anticipated by Funada et al. within the meaning of 35 U.S.C. §102(e).

The Examiner maintains that Funada et al. (Funada) discloses every feature of Appellants' invention as recited in claims 1, 3, 43-46, 48-50 and 52. In particular, the Examiner cites Funada's column 8, lines 2-3 and Figure 4 (see final Office Action (Paper No. 5) at page 6).

The arrangement shown in Funada's Figure 4 parallels the arrangement shown in Appellants' Figure. 4. That is, in Funada the portions of EL light emitting elements 200 that emit light to document 400 (i.e., the portions that contain light emitting layer 203 sandwiched by transparent electrode 201 and opaque metal electrodes 205) are not aligned with light receiving portions of light receiving elements 100 (i.e., the portions that contain photoconductive layer (a-Si) 102 sandwiched by electrodes 104). On the other hand, windows 206 do not emit light to document 400, but simply pass the light reflected from document 400 to light receiving elements

100. (See Funada at col. 6, lines 28-61; see also *Id.* at col. 9, lines 13-23 and Figure 6, at col. 9, line 47 - col. 10, line 53, and at col. 11, line 54 - col. 12, line 45, and Figures 9-11.)

Therefore, like Appellants' admitted prior art, Funada does not disclose, or even suggest, at least the feature of a light emission portion being substantially aligned with its corresponding light receiving element, as recited in Appellants' independent base claims 1 and 43. Likewise, like Appellants' admitted prior art, Funada does not disclose or even suggest an image sensor device wherein at least one light emission portion and its corresponding light receiving element substantially overlap, as recited in Appellants' independent claim 52. Therefore, independent base claims 1 and 43 (as well the dependent claims 3, 43-46 and 48-50 which more specifically define the features recited in their respective base claims) and independent claim 52 are not anticipated by (i.e., are not readable on) Funada.

4. Claims 2, 4-6, 47 and 51 would not have been obvious within the meaning of 35 U.S.C. §103(a) from Appellants' admitted prior art.

Appellants' dependent claims 2, 4-6, 47 and 51 incorporate all the novel and unobvious features of their respective base claims 1 and 43. Appellants' admitted prior art fails to teach or even suggest the features of Appellants' invention as recited in independent base claims 1 and 43 at least for the reasons set forth above (see part **2**). Therefore, dependent claims 2, 4-6, 47 and 51 would not have been obvious from Appellants' admitted prior art at least for the reasons set forth above (see part **2**) with regard to independent base claims 1 and 43.

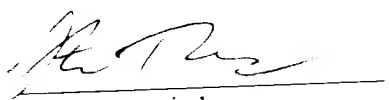
5. Claims 2, 4-6, 47 and 51 would not have been obvious within the meaning of 35 U.S.C. §103(a) from Funada et al.

Dependent claims 2, 4-6, 47 and 51 incorporate all the novel and unobvious features of their respective base claims 1 and 43. Funada fails to teach or even suggest the features of Appellants' invention as recited in independent base claims 1 and 43 at least for the reasons set forth above (see part **3**). Therefore, dependent claims 2, 4-6, 47 and 51 would not have been obvious from Funada at least for the reasons set forth above (see part **3**) with regard to independent base claims 1 and 43.

In view of the foregoing, Appellants submit that claims 1-14 are patentable under 35 U.S.C. §103(a). Therefore, the Board is respectfully requested to reverse the Examiner's final rejection.

The present Brief on Appeal is being filed in triplicate. Appellants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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Date: July 12, 2000

APPENDIX

CLAIMS 1-6 AND 43-52 ON APPEAL:

1. An image sensor device which optically reads out a document comprising:

an image sensor portion having a plurality of light receiving elements facing a document to be read out; and

a thin film light source arranged on the document side of said image sensor portion, said thin film light source emitting light to said document,

wherein said thin film light source includes a plurality of light emission portions, each of said light emission portions emitting light to said document, and corresponding to each of said light receiving elements, said light emission portions including a light blocking layer on said light receiving elements side, and said light emission portions being arranged between said light receiving elements and said document, at least one of said light emission portions being substantially aligned with a corresponding light receiving element.

2. The image sensor device according to claim 1, wherein each of the light emission portions of said thin film light source comprises a transparent electrode, an opaque electrode and an organic thin film held between the transparent and opaque electrodes and said opaque electrode is formed of a material which functions as a light blocking layer for a region other than said light receiving element of said image sensor section.

3. The image sensor device according to claim 1, further comprising light blocking means provided at a region other than said plurality of light receiving elements of said image sensor portion.

4. The image sensor device according to claim 1, wherein said image sensor portion includes image sensors formed on a crystalline silicon wafer or image sensors formed on a transparent substrate by thin film semiconductor processes.

5. The image sensor device according to claim 1, wherein said thin film light source emits light of a plurality of different colors.

6. The image sensor device according to claim 1, wherein an optical fiber collection member is provided between said thin film light source and said document.

43. An image sensor device which optically reads out a document comprising:

an image sensor portion having a plurality of light receiving elements; and

a thin film light source arranged on a document side of said image sensor portion, said thin film light source emitting light to said document,

wherein light emission portions of said thin film light source emit light to said document, and are arranged in one-to-one correspondence to each of said light receiving elements,

said light emission portions include a light blocking layer on a side facing said light receiving elements and are arranged between said light receiving elements and said document, and

at least one of said light emission portions is substantially aligned with a corresponding light receiving element.

44. The image sensor device according to claim 1, wherein each of said light emission portions is substantially centered with respect to said corresponding light receiving element.

45. The image sensor device according to claim 1, wherein each of said light emission portions has an area smaller than an area of a corresponding light receiving element of said plurality of light receiving elements.

46. The image sensor device according to claim 1, wherein substantially all surface area of said at least one of said light emission portions is between said corresponding light receiving element and said document.

47. The image sensor device according to claim 2, wherein said organic thin film comprises a plurality of individual and separate organic thin film areas, each of said organic thin film areas held between the transparent and opaque electrodes.

48. The image sensor device according to claim 43, wherein said at least one of said light emission portions is substantially centered with respect to said corresponding light receiving element.

49. The image sensor device according to claim 43, wherein substantially all surface area of said at least one of said light emission portions is between said corresponding light receiving element and said document.

50. The image sensor device according to claim 43, wherein each of said light emission portions is substantially centered with respect to a corresponding light receiving element of said plurality of light receiving elements.

51. The image sensor device according to claim 43, wherein each of the light emission portions comprises a transparent electrode, an opaque electrode and an organic thin film, said organic thin film further comprising a plurality of individual and separate organic thin film areas each of said organic thin film areas held between the transparent and opaque electrodes, and said opaque electrode is formed of a material which functions as a light blocking layer for a region other than said light receiving element of said image sensor section.

52. An image sensor device which optically reads out a document comprising:

an image sensor portion having a plurality of light receiving elements; and

a thin film light source arranged on a document side of said image sensor portion, said thin film light source emitting light to said document,

wherein light emission portions of said thin film light source are arranged in one-to-one correspondence to each of said light receiving elements,

said light emission portions emit light to said document, include a light blocking layer on a side facing said light receiving elements, and are arranged between said light receiving elements and said document, and

at least one of said light emission portions and a light receiving element corresponding to said at least one of said light emission portions substantially overlap.